REMARKS/ARGUMENTS

I. Status of Claims

Claims 1- 18 are pending in the application.

Claims 1, 2, 7-13 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by *Thompson* (United Kingdom Patent No. 1,596,330).

Claims 3-6, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Thompson* (United Kingdom Patent No. 1,596,330), in view of *Moore*, (U.S. Patent No. 6,062,213).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentabe over *Thompson*, (United Kingdom Patent No. 1,596,330), in view of *Moore*, (U.S. Patent No. 6,062,313), in further view of *Giannesini et al.*, (U.S. Patent No. 5,295,546).

II. Cancellation and Amendments of Claims

Claims 1 and 2 are canceled. Claim 3 has been amended. Claims 7-10 and 12 have been amended to depend on Claims 3. Claim 17 has been amended.

Claim 18 is new.

III. No New Matter

This amendment corrects certain typographical errors. No new matter is added by the amendment to the specification abstract or claims. Amended Claim 3 has been re-written in independent form and contains all its original limitations which are not made for purposes of obtaining allowance. New Claim 18 is supported by the disclosure.

IV. Improper Claim Rejection Under 35 U.S.C. § 102(b)

Claims 1, 2, 7-13 and 17 have been rejected under 35 U.S.C. § 102(b) as being anticipated by *Thompson*.

A. Claim Cancellation

Examiner's rejection of Claims 1 and 2 is now moot as these two claims are hereby canceled.

B. Claim Amendments

Paragraph 9 of the December 12, 2005 Office Action notes that *Thompson* does not discloses the limitation requiring "degasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas" which is a limitation in Applicant's Claim 3. Claims 7-12 have been amended to now depend on Claim 3. As such, the Examiner's rejection under 35 U.S.C. § 102(b) of Claims 7-12 is now moot.

Claims 13 and 17 have been amended to include a limitation, "degasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas," which was noted by the Examiner as not disclosed in *Thompson*. Accordingly, withdrawal of the 35 U.S.C. § 102(b) rejection to Claims 13 and 17 is also requested.

V. Improper Claim Rejection Under 35 U.S.C. § 103(a) as Unpatentable over - *Thompson* in view of *Moore*

Claims 3-6, 14 and 15 have been rejected as being unpatentable over *Thompson* in view of *Moore*. To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine the teachings; (2) there must be a reasonable expectation of success; and (3) the prior art reference (or references when combined) must teach or suggest all of the claim limitations. MPEP § 2142. *See also, In re Vaeck,* 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991) (emphasizing that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must be found in the prior art, and not based on applicant's disclosure).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab,* 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). The

mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills,* 916 F.2d 680, 16 U.S.P.Q.2d (Fed. Cir. 1990). The references cited are not properly combined.

A. *Moore* is Non-analogous Art

Applicant respectfully traverses on the ground that *Moore* is non-analogous art, therefore, one of ordinary skill in the art would lack the motivation to combine *Thompson* and *Moore* to piece together the invention as claimed. *Moore* cannot be considered to be within the same field of endeavor of applicant "merely because both relate to the petroleum industry." *In re Clay,* 996 F.2d 656, 659, 23 USPQ2d 1058 (Fed. Cir. 1992). According to MPEP 2141.01(a)(I), one of two criteria must be met for a reference to be considered analogous art.

> In order to rely on a reference as a basis for rejection of an applicant's invention, the reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.

i. *Moore* reference is not within the Applicant's field

The *Moore* reference is not within the applicant's field of endeavor. The *Moore* reference relates to *drilling* operations. Applicant's invention relates to production operations and subsequent transport of processing of produced hydrocarbons. The *Moore* reference focuses on the separation of drilling solids generated by a drilling bit from drilling mud. Applicant's invention focuses on methods and apparatus for reducing the infrastructure needed to produce oil and gas from remote offshore environments. Drilling well operations necessarily precede production operations, transport and processing of produced products. Thus, production is not a subset of drilling and cannot be within the Applicant's field. Cutting a borehole into an earth formation is an entirely different function than producing fluids from the borehole and transporting them to market. *Moore* cannot be considered to be within the same field of endeavor of applicant merely because both relate to the petroleum industry. *In re Clay* 966 F.2s 656, 659, 23 USPQ2d 1058 (Fed. Cir. 1992).

ii. *Moore* reference is not reasonably pertinent to Applicant's problem

Although drilling and production operations are two separate and distinct fields of endeavor, the *Moore* reference could be cited as analogous art *if* it is reasonably pertinent to the particular problem with which the inventor was concerned. However, *Moore* reference is not reasonably pertinent nor would it logically commend itself to the inventor's attention at the time of invention.

a. No Produced Gas Product Disclosed

In Section 9 of the Office Action, the Examiner states that the *Moore* reference discloses *produced gas* conveyed to a vessel (26)(emphasis added). The Examiner's reliance upon this statement is misplaced. Neither oil nor gas is intentionally produced in a drilling operation. Drilling operations are specifically designed to prevent production of oil and gas (*Moore*; Col. 1, lines 18-20), including uncontrolled production, commonly known as a blowout (*Moore*; Col. 1, lines 18, 20; Col. 1, lines 33-35; Col. 41-42; Col. 4, lines 13-22). Thus, the *Moore* reference is not reasonably pertinent to the production aspect of the particular problem with which the Applicant was concerned.

b. Vessel is for Receipt of Drilling Fluid with Associated Gas

In paragraph 9 of the Office Action, the Examiner states that the *Moore* reference discloses produced gas *conveyed to a vessel* (26)(emphasis added). The Examiner's reliance upon this statement is misplaced. *Moore's* vessel (26) is a settling tank for particulates contained in the drilling fluid which have not been removed in tank 40. (See *Moore*; Col. 3, lines 38-39 and Col. 3, lines 50-54.) *Moore's* other reference to a vessel is not shown in any figures, but is described as located nearby the drilling platform. This vessel is also for the receipt of drilling fluid. (See *Moore*; Col.3, lines 43-45) The *Moore* reference fails to suggest any produced gas product conveyed to a vessel. The Examiner's assertion is incorrect. The *Moore* reference would not have commended itself to the Applicant to solve the problem with which he was concerned.

c. No De-gasification of Subsea Hydrocarbons Disclosed

The third paragraph of Section 9 of the Office Action alleges that *Moore* "further discloses *de-gasifying hydrocarbons* obtained from the subsea hydrocarbons field *to produce oil and gas*." First, the *Moore* reference does not disclose de-gasifying hydrocarbons, the *Moore* separator (48) de-gasifies drilling mud (*Moore*; Col. 2, lines 21-24). Second, the separator (48) design would not be suitable for separating produced gas from produced oil. The volume of gas which is associated with drilling mud differs by orders of magnitude from the volume of gas which is produced from a subsea hydrocarbon field. The *Moore* reference explicitly discloses a separator (48) suitable and of a "known construction for separating gas from the drilling fluid." (See *Moore* at Col. 5, lines 20-22.). Third, the separator (48) disclosed by *Moore* only *temporarily* separates the gas associated with the drilling fluid. The reference explicitly discloses *recombining* the drilling fluid with its associated gas at the junction of the gas conduit (50) and the oil conduit (28) (*Moore*, Figure 1). Therefore, there is no "de-gasifying of hydrocarbons...to produce oil and gas." Moreover, as *all* gas and liquid products (drilling fluid) are remixed following separation, it is illogical for the *Moore* reference to be considered reasonably pertinent to the problem of producing separate gas and oil streams as claimed by Applicant (*Choi et. al.*; Claims 3-18).

d. Conveyance of Produced Oil to a Seabed Storage Tank Not Disclosed in *Moore*

The Examiner's assertion that the *Moore* reference also discloses conveyance of produced oil to a storage tank (40) on the seabed" (*Moore*; Fig. 1 and Claims 3-6) is mistaken. Figure 1 does not show a return conduit (28) for produced oil. Figure 1 does not show a hydrocarbon sub-sea separator or two conduits returning to the surface conveying produced oil or produced gas. *Moore's* return conduit (28) carries drilling fluids to the surface for re-circulation down the borehole. The drilling fluid carried to the surface by return conduit (28) also carries unsettled solids and re-combined associated gas from gas conduit

(50). Claims 3-6 all depend directly or indirectly on Claim 1. Claim 1 is reproduced for convenience below:

> 1. A system for separating particulate material from drilling fluid for underwater wells of a type which comprise a drilling platform, a string of drill pipe extending from the platform to a sea floor for drilling the well, an annulus extending into an earth formation beneath the subsea floor, the drill pipe running through the annulus into the formation for drilling a well in the formation, a means for circulating the drilling fluid downwardly through the string of drill pipe and upwardly through the annulus for removing particulate material generated from drilling the well, the system further including a return conduit and pump for returning the drilling fluid to a water surface, the system comprising:
>
> a. an expandable tank positioned on the seabed floor and connected between the annulus and the return conduit so that the drilling fluid flows through the tank
>
> b. the tank being shaped and dimensioned to allow at least a substantial amount of particulate material to settle out of the frill fluid as the fluid flows through the tank to the return conduit.

Applicant does not claim the conveyance system as disclosed in Claim 1 or its dependents, 3-6. Applicant does not claim: 1) a system or method for separating particulate material from a drilling fluid; 2) a drilling platform; 3) any drill pipe, which is necessarily different from a production riser, due to the need for drill pipe to rotate; 4) any circulation of drilling fluid downwardly through the drill pipe and upwardly through the annulus to remove particulate material generated from drilling the well; 5) a return conduit for drilling fluid; 6) a return conduit being connected with a line to recombined the associated gas separated from the drilling fluid to produce gas lift which reduces pumping requirements for the drilling fluid (See Figure 1); 7) an expandable tank; 8) a tank positioned on the seabed floor and connected between the annulus (between the drill pipe and borehole of the well); and 9) a tank being shaped and dimensioned to allow at least a substantial amount of particulate material to settle out of the drilling fluid as the fluid flows through the tank to the return conduit. As *Moore's* Claims 3-6 all

depend directly or indirectly from Claim 1. Claims 3-6 do not overcome the lack of disclosure by Claim 1. Figure 1 of the *Moore* references discloses the conveyance system as described in Claim 1 and Claims 3-6 of *Moore*. Figure 1, like Claim 1, fails to disclose a solution to the problem with which the Applicant was concerned. *Moore* is not within the filed of the of applicant's endeavor. *Moore* is not analogous art.

e. No Conveyance of Produced Gas through a Riser to a Vessel Disclosed

The Examiner states that *Moore* discloses produced gas being conveyed to a vessel via a riser citing *Moore's* Figure 1 and page 3, lines 40-41. The Examiner reliance on this citation is mistaken. First, Figure 1 does not show a produced gas stream or a means to convey the gas to a vessel. The object of a drilling operation is not to produce gas (*Moore*; Col. 1, lines 18-20). The vessels disclosed are designed for separation of solids from drilling fluid (*Moore*; Col. 3, lines 50-53). Minor amounts of gas associated with the drilling fluids, which is separated and recombines with the drilling fluid before being sent to the vessel, should be removed before the drilling mud is re-circulated down the borehole. Nevertheless, no recovery of the minor amount of gas associated with the drilling fluid is disclosed, taught or suggested in *Moore*. In contrast, Applicant's invention claimed produces gas and oil products. Please note that Applicant's invention involves use of at least two risers. One for produced gas riser (184) is shown in Figure 10 and one for produced oil (104) is shown in Figure 9. The *Moore* reference does not disclose, teach or suggest production of gas. It is not reasonably pertinent to the problem with which the inventor was concerned, not within the field of endeavor of the applicant, and not analogous art.

B. No Suggestion or Motivation to combine *Moore* and *Thompson*

Even if, for argument sake only and without concession, the *Moore* reference was considered analogous art, no suggestion or motivation exists to combine *Moore* and *Thompson.* The Examiner admits that *Thompson* fails to disclose 1) de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field *to produce oil and gas* and 2) conveying the *produced oil* to a storage tank on the seabed. To derive these missing claim elements, the Office Action

improperly combines the *Moore* reference with the *Thompson* reference. The Examiner asserts that "given the suggestion in Moore, it would have been obvious to one of ordinary skill in the art to incorporate the fluid separation and seabed oil storage method and system taught in Moore into the method and system of Thompson because most natural gas fields have associated oil production that must be stored or piped to shore, (Thompson; page 16-19), and seabed tanks provide an economical, environmentally-safe, and transportable storage means" (Office Action; page 7, 2nd paragraph).

Applicant is somewhat uncertain regarding what the suggestion is, but assumes the suggestion involves the following combined elements cited by the Office Action beginning with the last paragraph on page 6 as set forth below:

> Unlike Thompson, Moore further discloses de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas (page 6 lines 29-35 and page 5 lines 20-25), and conveying the produced oil to a storage tank (40) on the seabed (Fig. 1)(claims 3 and 6). Moore also discloses the produced gas being conveyed to the vessel via a riser (Fig. 1, page 3 lines 40-41) (claims 4 and 14).

Applicant disagrees that such a "suggestion in Moore" exists. As discussed above, the de-gasification step in *Moore* is temporary. The de-gasification step separates drilling mud from associated gas, not hydrocarbons. Drilling operations are designed to avoid production of oil or gas from hydrocarbon fields, sub-sea or otherwise. No sub-sea oil conveyance system or method is disclosed or taught. *Moore* makes a broad sweeping statement that storage tanks can be used to store oil on land or subsea floor. *Moore* does not disclose, suggest or teach produced oil or gas being conveyed to a vessel via a riser. A "suggestion" cannot be formulated from non-disclosed elements. Thus, *Moore* fails to suggest one of ordinary skill in the art to combine *Moore* with *Thompson.*

When the motivation to combine references in not readily apparent, the examiner needs explain the reasons why one skilled in the art would make the cited combination. (MPEP 2142, citing *Ex parte Skinner,* 2 U.S.P.Q.2d 1788 (Bd. Pat. App. & Inter. 1986). The Examiner asserts the combination of *Moore* with *Thompson* would have been obvious "because most natural gas fields have associated oil production that must be stored or piped to shore (Thompson; page 16-19), and seabed tanks provide an economical, environmentally-safe, and transportable storage

means." The fact that natural gas fields have associated oil production does not make the connection between totally different operations readily apparent. Furthermore, the Examiner's assertion that gas and oil production must be stored or piped to shore is an overstatement, especially with regard to remote offshore production. As disclosed in Applicant's specification, paragraph [0012], natural gas produced offshore may be "re-injected into a subsurface formation, flared onsite, or exported by pipeline." Storage or shipment of gas is not required. Moreover, in the case of re-injecting gas to help produce or lift the oil from the formation, shipment of the gas to shore is not desired. Similarly, the Examiner's statement regarding seabed tanks as "economical, environmentally-safe, and transportable storage means" is an overstatement and insufficient to provide motivation to combine the dissimilar processes of *Moore* and *Thompson.* No motivation to combine a gas liquefaction process to produce LNG with a drilling system or method exists and reasons for such is not found in either *Moore* or *Thompson*, nor is explained in the Office Action.

C. Prior Art References do not Disclose, Teach or Suggest all of the Claim Limitations

The Examiner admits that *Thompson* fails to disclose 1) de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field *to produce oil and gas* and 2) conveying the *produced oil* to a storage tank on the seabed. To derive these missing claim elements, the Office Action improperly combines the *Moore* reference with the *Thompson* reference. Even if, for arguments sake only and without concession, it would be proper to combine *Moore* with *Thompson*, the combination fails to meet the "all elements test." The *Moore* reference is mistakenly combined by the Examiner to supply the missing elements of "de-gasifying hydrocarbons obtained from the sub-sea hydrocarbons field to produce oil and gas, and conveying the produced oil to a storage tank on the seabed." No de-gasifying of hydrocarbons is disclosed, only de-gasification of drilling fluid. Gas production is not disclosed. Sub-sea oil production is not disclosed. A conveyance system for produced oil to a seabed storage tank is not disclosed. A bare statement that an expandable storage tank may be used to store oil is insufficient and does not disclose, teach or suggest a conveyance system for produced oil sub-sea. Applicant, therefore, respectfully requests withdrawal of rejections to Claims 3- 6. Their dependents (7-12) and Claims 14 and its dependents (15-17) under 35 U.S.C. § 103(a).

i. Claim Limitation not Disclosed, Taught, or Suggested by *Moore* – De-gasification of Sub-sea Hydrocarbons

The de-gasification step separates drilling mud from associated gas, not hydrocarbons. Without sub-sea production of hydrocarbons being disclosed, no de-gasification of sub-sea hydrocarbons can be disclosed. Moreover, drilling operations are designed and operated to prevent production of oil and gas. No proposed suggestion by way of modification of the *Moore* disclosure is therefore proper. For arguments sake while not conceding such, if any suggestion exists, "the proposed modification cannot render the prior art unsatisfactory for its intended purpose" (MPEP 2143.01; V). Thus, a system for sub-sea hydrocarbons is neither disclosed, taught or suggested by *Moore*.

In addition, not only would the separation apparatus described in *Moore* be unsatisfactory for its intended purpose, no reasonable expectation of success exists for its use to de-gasify produced sub-sea hydrocarbons for at least three reasons. (See MPEP 2143.02.) First, the gas separation step is temporary. This separation design and system provides for easier separation of solids from the drilling fluid. The recombination of the drilling fluid with its associated gas is an advantageous design to provide gas lift and to reduce pumping requirement for returning the drilling fluid with remaining solids to the surface before recirculation. Second, the volume of gas in a drilling operation is orders of magnitude different than the volume of gas in a production operation. Third, the *Moore* design and tank residence times for partially separating solids and fluid is different than separating produced gas, oil and possibly water.

iii. No Conveyance of Produced Oil through a Riser to a Vessel is Disclosed, Taught or Suggested in *Moore*

The conveyance system disclosed by *Moore* is not for producing oil, but for re-circulating drilling fluid to the surface and back down the borehole. Neither the return conduit nor the overall conveyance system taught by *Moore* is designed for oil production. The conveyance system takes advantage of the

drilling fluid's density and elevation to gravity flow from the wellbore into the tank (Figure 1). The location of the tank is to provide a reservoir of drilling fluid to reduce the time to provide drilling fluid into the wellbore to avoid blowouts. Thus, the conveyance system taught is designed is to allow for two-way flow from the *Moore* tank. No conveyance system for produced oil is taught. It would be counter-productive to flow produced oil back to the wellbore. For arguments sake while not conceding such, if any suggestion exists, any suggestion would not make the combination of the *Moore* reference with the *Thompson* obvious. "The proposed modification cannot render the prior art unsatisfactory for its intended purpose" (MPEP 2143.01; V.) Neither is there a reasonable expectation of success for its use. (See MPEP 2143.02.)

Claims 1 and 2 have been canceled. Applicant respectfully contends that Claims 3-6, 14 and 15 are patentable over *Thompson* in view of *Moore,* in combination, assuming for arguments sake only, that the two could be properly combined.

C. Prior art references do not teach or suggest all of the claim limitations

Improper Claim Rejection Under 35 U.S.C. § 103(a) - *Thompson* in view of *Moore* and Giannesini

For reasons previously stated, with respect to *Moore* and *Thompson*, Applicant respectfully traverses the Examiner's 35 U.S.C. § 103(a) rejection of Claim 16 as unpatentable over *Thompson* in view of *Moore* and *Giannesini*. Therefore, *Thompson*, in view of *Moore* and *Giannesini* does not render Claim 16 obvious under 35 U.S.C. § 103(a). Applicant again respectfully requests withdrawal of this rejection of Claim 16.

VI. Conclusion

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance and an early reconsideration and a Notice of Allowance are earnestly solicited.

If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of

time sufficient to enable this document to be timely filed. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 16-0575. Any refund should be credited to the same account.

Dated: March 13, 2006

Respectfully submitted,

By: Patricia A. Meier
Registration No.: 43,798
ConocoPhillips Company
600 North Dairy Ashford
Houston, Texas 77079
Phone: (281) 293-5749
FAX: (281-293-3700
Attorney for Applicant

f:\ip\meier\patent files\9343.0-00us\pto\response to oa.031306.doc